DEPARTMENT OF OPTOMETRY
COLLEGE OF MEDICINE AND HEALTH SCIENCES
UNIVERSITY OF GONDAR

QUALITY OF LIFE AND ASSOCIATED FACTORS AMONG PATIENTS WITH GLAUCOMA ATTENDING AT UNIVERSITY OF GONDAR HOSPITAL,NORTHWEST ETHIOPIA.

PRINCIPAL INVESTIGATOR: BANCHAMELAK ZERAYE (BSc)

ADVISORS:

Dr. FISSEHA ADMASSU (MD, Asst Prof)

Dr. YARED ASSEFA (MD, MPH)

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APPROVED BY THE EXAMINING BOARD

	Name	Signature	Date
Examiner:	_____	_____	_____
Examiner:	_____	_____	_____

Advisors:

Dr Fisseha Admassu (MD, Asst Pro)	_____	_____
Dr Yared Assefa (MD, MPH)	_____	_____

_____

Chair of Department or Graduate Program Coordinator

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Acronyms

AOR	Adjusted Odds Ratio
ARMD	Age Related Macular Degeneration
CACG	Chronic Angle Closure Glaucoma
CD-Ratio	Cup to Disk Ratio
COR	Crud Odds Ratio
DC	Data Collectors
DD	Disc Diameter
ETB	Ethiopian Birr
GQOL-15	Glaucoma specific Quality of Life 15
HRQOL	Health-Related Quality of Life
IRB	Institutional Review Board
MPH	Master of Public Health
OR	Odds Ratio
PI	Principal Investigator
POAG	Primary Open Angle Glaucoma
QOL	Quality Of Life
SPSS	Statistical Package for the Social Sciences
UGECTC	University Of Gondar Eye Care and Teaching Center
VA	Visual Acuity
VF	Visual Field
VI	Visual Impairment
VRQOL	Vision Related Quality Of Life
WHO	World Health Organization

Table of contents

List of tables

List of figures

Abstract

Background: Glaucoma is a kind of lifelong disease characterized by irreversible optic nerve damage and visual field loss which lead to visual impairment and blindness. This ultimately limits person`s independence and compromises overall quality of life.

Objective: to assess the quality of life and associated factors among patients with glaucoma attending University of Gondar Hospital, Northwest Ethiopia.

Methods: Institution-based cross-sectional study was conducted from April –May 2015 at University of Gondar Hospital. The sample size of this study was 307 patients with glaucoma. Consecutive patients who came to the hospital during the study period were included. Structured questionnaire was used for interviewing the study participants. A modified glaucoma quality of life -15 was used. Data was cleaned, coded and entered into EPI-INFO version 7 and was exported to SPSS version 20 for analysis. Logistic regression was used and association was interpreted using odds ratio and confidence interval .P-value < 0.05 was considered statistically significant in this study.

Results: One hundred sixty two (52.8%) of the respondents had poor quality of life. Respondents age 40-70(AOR=3.51,95%CI:1.19-10.28) and ≥71 years old (AOR=3.72,95%CI:1.15-12.02),rural residence (AOR=2.16,95%CI:1.10-4.22), married (AOR=2.27,95%CI:1.13-4.56), monthly income of < 400 EB (AOR=10.79,95%CI:3.36-34.64), diagnosis time 1-5 years (AOR=2.57, 95%CI:1.29-5.15), moderately visually impaired (AOR=4.09,95%CI:2.02-8.34) and those with severe visual impairment (AOR=2.54,95%CI 1.01-6.39), moderate glaucoma (AOR= 4.09, 95%CI: 2.02-8.34), and severe glaucoma (AOR= 2.88, 95%CI: 1.21-6.84) were found to be significantly associated with poor quality of life.

Conclusion: This study indicates that high proportion of patients with glaucoma have poor quality of life. Increasing age, rural residence, low monthly income, long time of diagnosis, increasing visual impairment and increasing glaucoma staging were significantly associated with poor quality of life. Establishing glaucoma screening program at community level for early detection and treatment, increasing income, giving special attention for rural community and elders are important factors for improving the quality of life of patients with glaucoma.

Keywords: Glaucoma, Quality of life, GQOL-15.

1. Introduction

1.1. Statement of the problem

Vision related quality of life (VRQOL) is defined as a person's satisfaction with their visual ability and how their vision impacts on their daily life(1).

Over all QOL is compromised by glaucoma which represents a heterogeneous group of diseases that have in common characteristics form of damage to the optic nerve and visual field loss. The badness of Glaucoma is first affects mid periphery of visual field then central vision. This makes glaucoma patients tend to be asymptomatic until late in the disease(2). And it is believed that affects an individual quality of life negatively (3).

According to the WHO, "Quality of life is defined as individuals' perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". It is a broad concept affected in a complex way by the person's physical health, psychological state and level of independence, social relationships, to most important features of their environment (4).

Glaucoma patients experience difficulty in recognizing faces, reading, watching television, noticing objects in their peripheral vision, adapting to different levels of lighting and glaucoma patients are also at a higher risk of falls and accidents(5).

Besides to visual field loss and visual impairment, living with a chronic disease like glaucoma affects an individual QOL negatively by the diagnosis itself, cost and side effect of the drug, intolerance of the daily treatment and need of intensive and lifelong follow up (6).

There are limited information from Ethiopia focusing on this study area , and thus this study may present as a baseline information on proportion of quality of life and associated factors of patients with glaucoma in Ethiopia in general and in particular for the study area.

1.2 Literature review

Glaucoma is public health importance globally being the second leading cause of irreversible blindness(7).

A systematic literature review study conducted on QOL among peripheral vision loss and central vision loss glaucoma and Age Related Macular Degeneration (ARMD) respectively revealed that both affects general vision and treatment expectations domains, but glaucoma mostly affects mental aspects of QOL and un like glaucoma, ARMD affects physical aspect of QOL, in general ARMD affects patients QOL more than glaucoma (8).

A retrospective study was conducted at four European countries (France, Denmark, Germany and United Kingdom) on late stage glaucoma patients revealed that visual acuity was positively correlated with QOL (9).

A study conducted in USA based on six vision-related activities (two visual function questions, and five physical functioning domains) those subjects who have severe visual field (VF) loss was associated with difficulty of daily living activities such as social activities, leisure, worrying about eyesight, of these the most difficult are; day time driving in familiar places and noticing objects off to the side when walking(10).

A study done on impact of dry eye on daily life (QOL) in patients with glaucoma who use and who are not use anti glaucoma medications in USA at the Miami Veterans Affairs, there is an association between number of medication with dry eye symptom in turn dry eye symptoms has strong association with QOL(11, 12),also black race glaucoma patients has severe dry eye symptom and low QOL than white patients(12).

A cross sectional study also done in USA patients with bilateral glaucoma showed that reduced their QOL than patients without glaucoma and those who had unilateral glaucoma were reported that less difficulty on their activities of daily tasks as compared to those who had bilateral glaucoma (13)

Another study also done in USA on aged patients with glaucoma whose ages are greater than or equal to 65 to assess factors of topical medication use and health related quality of life (HRQOL) showed that medication usage difficulty was strongly associated with low HRQOL than other factors: drug compliance, belief in benefit of medication use usage assistance and complexity of medication regimen (14).

.To assess functional status and well-being in glaucoma patients who live in a developing country, Cross-sectional case control study was conducted in Brazil patients with glaucoma who live in developing country had low physical functioning, role-emotional, bodily pain, social functioning and mental health than control groups(15).

Another study was done in Brazil on Association between change in binocular Retinal nerve fiber layer loss (RNFL) thickness and change in visual function, after controlling confounding factors there is a strong association between QOL and RNFL loss so degree of RNFL loss are a good measurement scale for level of QOL of the patient(16).

In Brazil a cross sectional comparative study also done among glaucoma patients on impact of medical and surgical treatment on patients HRQOL, early glaucomatous patients who under gone to surgical treatment had low QOL due to psychological burden, unlike moderate and advanced glaucoma patients who had similar QOL for both medical and surgical therapies(17).

Cross sectional study was also done using NEI-VFQ (national eye institute –visual function questionnaire in Brazil on patients with glaucoma of different stages revealed that patients who attend private practice had better QOL than public health institution users (18).

Norwegians study showed that 80% of patients with glaucoma had negative effect on their QOL because of being glaucoma patient moreover younger and female patients were less satisfied than males on their life (19).

A cross-sectional study conducted in Madrid, Spain in the relationship between visual function and the perceived quality of life in patients with glaucoma and ocular hypertension found moderate relationship between quality of life, visual acuity and visual field loss, so measuring quality of life is useful for management of patients with glaucoma (20).

A study done in two different sites of Sweden showed that glaucoma patients had low health related QOL than control groups, and it is associated due to reduced VA and VF and co morbidity of systemic cardiovascular and non vascular diseases as well, this study also stated that topical beta –blocker had no negative effect on their HRQOL(21).

Japanese study showed that the result of poor QOL for elderly patients with glaucoma is due to loss of hope for future rather than the disease symptom itself (22).

Study conducted in China on relationship between visual impairment of glaucoma and quality of life, showed that visual impairment affects patient QOL negatively (23).

A study done in India dark adaptation and glare is the most problem for glaucoma patients (24).Another study also done in China showed that glaucoma patients have greater difficulty on activities which involve: glare and dark adaptation, central and near vision, peripheral vision and outdoor mobility respectively(25), similarly in Indonesia dark adaptation and glare were strongly correlate with visual field loss(26).

A Nigerian comparative study showed that glaucoma patients QOL were affected by POAG even it is mild, also this study reveals those patients who are women and who have high educational status had better VR-QOL (27).but in China there is no QOL difference among male and female glaucoma patients (28).

Conceptual frame work

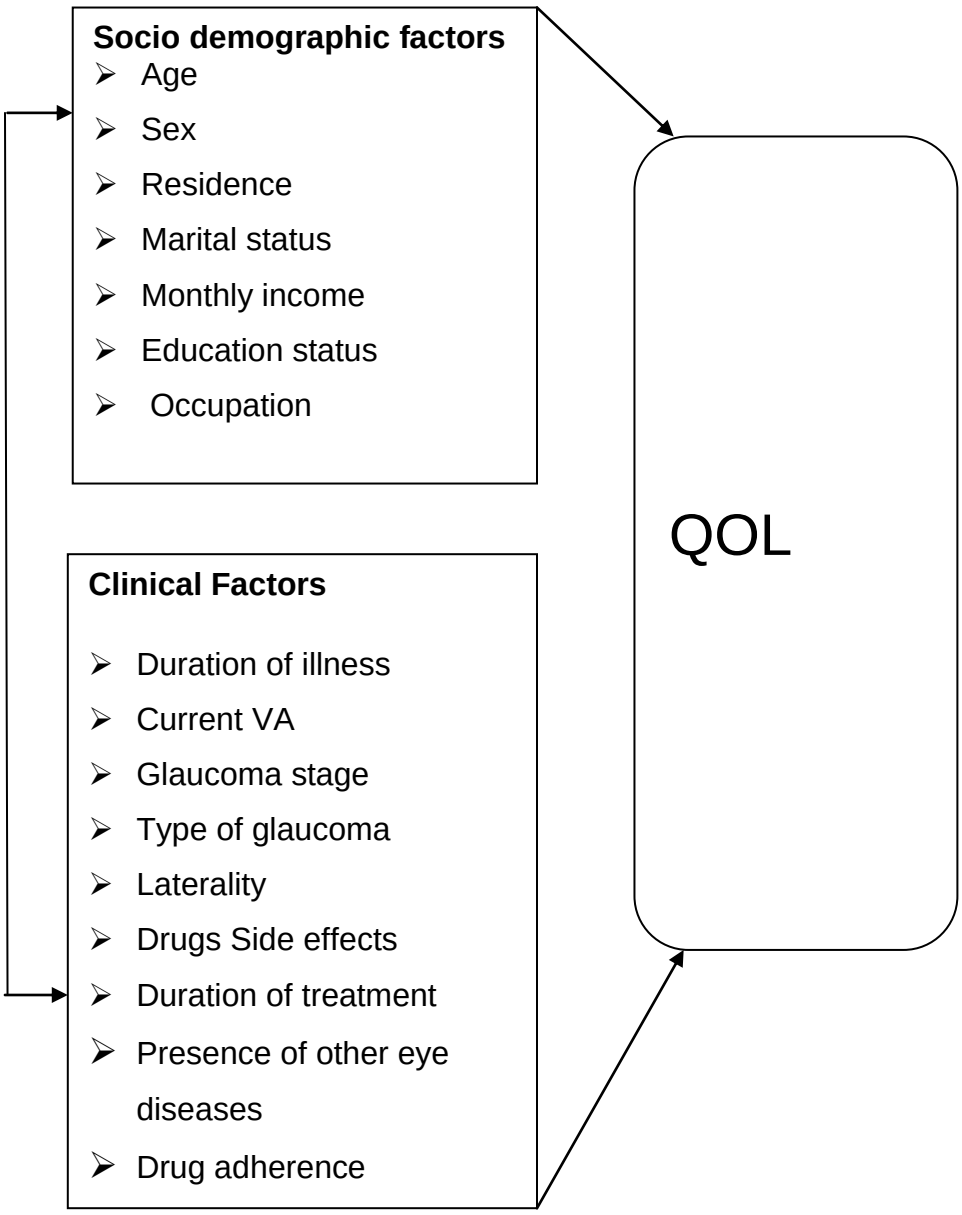

Figure 1:- Conceptual framework showing possible associated factors with quality of life of patients with glaucoma, university of Gondar hospital eye care and teaching centre, Gondar Ethiopia 2015**.**

1.3 Justification of the study

Individuals diagnosed with glaucoma can lose their QOL for several reasons: worry and anxiety due to diagnosis of a chronic illness, functional loss, the inconvenience of the treatment, side effects, and cost of the therapy(29, 30).

The main goal of glaucoma treatment is to maintain the patient's QOL, which includes preservation of visual function, at a sustainable cost,(29, 31). So far clinical indicators have been used but patients are not interested unless it translates into their QOL improvement, therefore measuring QOL implies patients' ability of day to day activities and also patients' perception becomes central to determine, evaluate and monitor treatment outcome. Therefore evaluation of QOL based on patients subjective assessment of their visual function is very useful instrument which helps to decide about the ways of treatment(32).

Though, much has been written on this subject in developed countries, little research has been done in developing countries including Ethiopia.

Therefore, this study was conducted to assess and identify factors associated with quality of life among adult glaucoma patients, generate necessary data to support and guide for glaucoma management policies, and also provide baseline for further similar studies to allow detailed description of unique factors that facilitate or inhibit the quality of life in glaucoma patients.

2. Objectives

2.1 General objective

- Quality of life and associated factors among people with glaucoma at university of Gondar Hospital, Gondar, Ethiopia 2015.

2.2 Specific objectives

- To estimate the magnitude of poor quality of life of patients with glaucoma.
- To identify factors associated with poor quality of life of patients with glaucoma.

3. Methods and materials

3.1 Design and period

Institution based cross -sectional study was conducted from April 24 to May 27, 2015.

3.2 Study area

The study was conducted at University of Gondar hospital eye care and teaching center. It is a referral hospital that serves a total catchment population of about 5 million that includes 6 zones of Amhara region and 2 zones from adjacent regions of Tigray and Benshangul. Eye care and teaching center of the university hospital is tertiary levels that serve for who are living in Gondar administration zone and the neighboring regions. It is the only tertiary eye care center for population in the northwest Ethiopia. And it has five special clinics (anterior segment, pediatric and strabismus, vitro-retina and refraction) among that Glaucoma is the one.

3.3 Source population

All adult patients with glaucoma on follow up at UGHECTC.

3.4 Study population

All adult patients with glaucoma who are on follow up at UGHECTC–who came during the study period.

3.4.1 Inclusion criteria

Adult patients who were clinically diagnosed with glaucoma in the outpatient department of UGHECTC-whose age 18 years and above were included in the study.

3.4.2 Exclusion criteria

Newly diagnosed patients with glaucoma of less than three month were excluded.

3.5. Sample size and sampling procedures

3.5.1 Sample size

Using single population proportion formula the sample size was calculated as follows;

$$n = \frac{\left(Z\frac{\alpha}{2}\right)^2 p(1-p)}{(d)^2}$$

Where: n =sample size

Z (α/2) = Z score at 95% CI=1.96

P= prevalence of quality of life among glaucoma patient, as prevalence of QOL among glaucoma patient is unknown in Ethiopia. = p= 50%.

q= 1-p

d= margin of error=5%

$$= \frac{(1.96)^2.0.5(0.5)}{(0.05)^2}$$

= **384**

Since the total population number is less than 10,000, by using correction formula.

$n_f = n_0/1+_{no}/N$

n_f = total sample size

n_o= sample size from the above

N = total population

n_f = 384/ (1+ (384/1113)

n_f = 384/1.345=**286**

But because of non-respondents and incomplete patient chart, we have to add 10% non-response rate.

$n_f = n_o$+ 10% = 314.55

= 315

3.5.2 Sampling technique

To select 307 patients from a total of 1,113adult patients with confirmed glaucoma that were diagnosed by senior glaucoma specialist, all consecutive patients who came to the hospital were included for the study until the required sample were obtained.

3.6. Study variables

3.6.1. Dependent variable

- Quality of life (poor/ good QOL).

3.6.2. Independent variables

- Socio–demographic variables such as:-
  - Age
  - Sex
  - Residence
  - Marital status
  - Religion
  - Ethnicity
  - Education
  - Occupation
  - Monthly income
- Clinical characteristics ;
  - Time of diagnosis
  - Visual acuity (Snellen VA chart)
  - Stage of glaucoma (based on CD-ratio)
  - Glaucoma diagnosis
  - Laterality
  - Drug Side effects
  - Duration of treatment
  - Presence of other eye diseases
  - Drug adherence

3.7. Operational definitions

Good QOL: - individuals who scored less than mean in the Glaucoma Quality of Life scale are considered to have good quality of life.

Poor QOL: - individuals who scored greater than or equal to mean in the Glaucoma Quality of Life scale are considered to have poor quality of life.

Non adherent: a person having glaucoma and using anti glaucoma drugs and Scoring 3 or more on the 8 item Morisky medication adherence screening tool.

Glaucoma staging: By using better eye cup to disc ratio (CDR) (33), glaucoma staging classified as mild (≤0.65 DD), moderate (0.7- 0.85CDD) and sever (≥0.9 DD).

3.8. Data collection tools and procedures

Data were collected by using a structured questionnaire consisting socio-demographic characteristics, clinical factors of glaucoma, glaucoma quality of life and drug non adherence. Face to face interview and patient's medical chart review were employed to obtain the data.

Concerning quality of life GQOL-15 contains 15 items and 4 domains of visual function: central and near vision (2 items), peripheral vision (6 items), glare and dark adaptation (6 items) and outdoor mobility (1item) (34)**.**

The internal consistency of the instrument was checked by face validity by one glaucoma specialist and two MPH holders and Cronbach"s alpha was (0.96),corrected item total correlation (0.5 - 0.8) further confirmed good homogeneity of the questionnaire. This instrument is reported to have psychometric property as it was validated at USA (35), Germany (36) and China (37).

Each item of the questionnaire is scored from 0 – 5, 0(abstinence from activity owing to non-visual reasons), 1(no difficulty), and 5 (severe difficulty). Summary scores represented the sum of item-level response scores with higher scores indicating poorer G-QOL.

Sub-scale was calculated for each factor by averaging the sum of scores generated for the item-level responses. Higher subscale scores represented more difficulty with vision related activities and poor G-QOL. The mean score of each domain and the total score was also calculated since quality of life measures in studies are often presented by mean (33).

Drug non adherence was assessed using the 8 item version of self-reporting questionnaire of Morisky medication adherence rating scale (MMARS) (38).

3.9. Data quality assurance

All questionnaires was translated into the local language Amharic and then translated back into English by experts and senior ophthalmologist and 5 % (15) of the questionnaire was pre-tested in Bahir Dar town at Felege-Hiwot Referral Hospital, two days training was given for data collectors and supervisors on the questionnaire to be used, the purpose of the study and how to approach respondents and obtain consent.
Two interviewers (data collectors) were assigned to administer the questionnaire after informed consent and the principal investigator and supervisor (optometrist) was engaged to review the chart, strictly supervise the data collection process and ensure completeness and consistency during and after the data collection process.

3.10. Data processing and analysis

The coded Data was checked, cleaned and entered into Epi Info version 7 and was exported into SPSS window version 20 for analysis. Frequencies, percentage, mean, standard deviation and graphs were used to describe study results.

Logistic regression model was performed to assess the association between binary outcomes and different explanatory variables. Bivariate analysis was first conducted for each potentially explanatory variable. Variables that satisfied p-value < 0.2 were selected for further analysis using multiple logistic regression model. The strength of association was interpreted using odds ratio and confidence interval. P-value < 0.05 was considered statistically significant in this study.

3.11. Ethical consideration

Ethical clearance and approval was obtained from institutional review board of University of Gondar, college of medicine and health science ethical review committee. And Official letters was obtained from department of optometry. Informed consent was gained from participants and they were informed that participation were on voluntary basis and were given the right to refuse to take part in the study as well as to withdraw at any time during the interview process. No names or identifying information were indicated on the questionnaires, and all subjects were assured of confidentiality.

4. Results

4.1. Socio-demographic characteristics of the respondents

A total of 307 study participants were interviewed giving a response rate of 97.5%. Among study participants, 201 (65.5%) were male. The mean age of the respondents was 60.33 (SD±14.01) years. Majority of respondents were in between 41and 70 years of age group191 (62.2%), 170 (55.4%) of the respondents live in rural setting, 138(45%) were unable to read and write, 130(42.3%) were farmers, 216 (70.4%) were married and 298 (97.1%) are Amhara, 283 (92.2%) Orthodox, 149(48.5%) had a monthly income of <400 ETB (Table 1).

Table_1.Socio-demographic characteristics of study participants at university of Gondar hospital eye care and training center, Gondar, 2015 (N= 307).

VARIABES	CATAGORIES	FREQUENCY	PERCENTAGE
Sex	Male	201	65.5
	Female	106	34.5
Age	18-40	42	13.7
	41-70	191	62.2
	>=71	74	24.1
Residence	Urban	137	44.6
	Rural	170	55.4
Education	Unable to read and write	138	45.0
	Able to read and write	93	30.3
	Primary education	29	9.4
	Secondary and above	47	15.3
Marital Status	Married	216	70.4
	Currently unmarried	91	29.6
Religion	Orthodox	283	92.2
	Muslim/Protestant	24	7.8
Occupation	Government Employee	56	18.2
	Farmer	130	42.3
	House wife	65	21.2
	Dependent on family	56	18.2
Ethnicity	Amhara	298	97.1
	Tigre	9	2.9

4.2. Clinical characteristics of the respondents

Regarding on time of diagnosis 194 (63.2%) were between one and five years, 70 (22.8%) of the respondents were severely visually impaired, 113(36.8%) respondents had sever glaucoma, of all the respondents 279 (90.9%) had bilateral glaucoma, 164(53.4%) had primary open angle glaucoma followed by 111(36.2%) had Pseudoexfoliative glaucoma.

One hundred forty nine (48.5%) had other ocular disease, of these 104(33.9%) was cataract, 155(50.5%) had no drug side effects, 156(50.8%) were on treatment for less than one year, Two hundred sixty six (73.3%) were non adherent to the drugs (Table2).

Table_2: Clinical characteristics of study participants at university of Gondar hospital eye care and teaching center, Gondar, 2015 (n= 307).

Variables	Categories	Frequency	Percentage
Time of diagnosis	< 1 year	75	24.4
	1-5 years	194	63.2
	≥ 6 years	38	12.4
Current Visual Acuity	Normal	111	36.2
	Moderate VI	126	41.0
	Sever VI	70	22.8
Stages of glaucoma	Mild	126	41
	Moderate	68	22.1
	Sever	113	36.8
Drug side effect	No	155	50.5
	Yes	152	49.5
Duration of treatment	< 1 year	156	50.8
	1-5 years	130	42.3
	≥ 6 years	21	6.8
Laterality	Bilateral	279	90.9
	Unilateral	28	9.1
Glaucoma type	POAG	164	53.4
	Pseudoexfoliative	111	36.2
	CACG	32	10.4
Other ocular disease	Yes	149	48.5
	No	158	51.5
Drug Adherence	Adherence	82	26.7
	No Adherence	225	73.3

4.3. Glaucoma related quality of life of respondents

4.3.1. Distribution of overall QOL

In this study 52.8% (95% CI: 47.2 - 58.6%) of Glaucoma patients have poor quality of life.

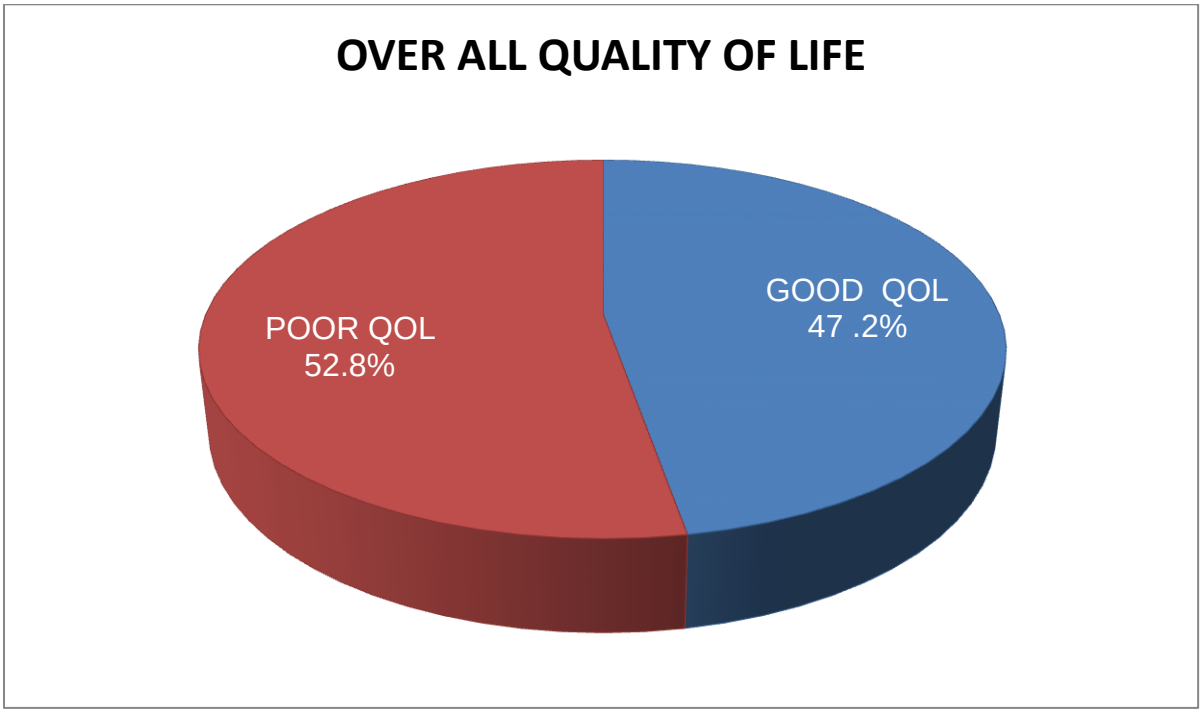

Figure 2: pie chart showing overall quality of life among glaucoma patients attending at university of Gondar hospital eye care and teaching centre, Gondar Ethiopia, 2015.

4.3.2 Distribution of Domains of QOL

The GQOL-15 covers four different domains of quality of life, central and near vision, outdoor mobility, peripheral vision and (dark adaptation and glare). In the central and near vision aspects 45% (95% CI: 39.4 - 49.9%), outdoor mobility 56.7% (95% CI: 51.1 - 63.1%), peripheral vision 50.5% (95% CI: 44.0 - 56.4%) and dark adaptation and glare 54.1% (95% CI: 48.9 - 59.6%) of respondents scored above the mean of each subscale (Table 3).

Table 3 Distribution of four subscales of GQOL-15 among glaucoma patients at university of Gondar eye care and teaching center, Gondar Ethiopia, 2015 (n=307).

Variables	Mean ±SD	Poor QOL Frequency	Good QOL Frequency
Central and Near vision domain	(6.1±2.6)	138(45)	169 (55)
Outdoor mobility domain	(2.8±1.55)	174(56.7)	133 (43.3)
Peripheral vision domain	(17.2 ± 7.6)	155(50.5)	152 (49.5)
Dark adaptation and Glare domain	(20.2± 7.09)	166 (54.1)	141 (45.9)

4.4. Factors associated with quality of life

4.4.1 Bivariate analysis

In the bivariate analysis variables including age, sex, residence, marital status, religion, education, occupation, monthly income, time of diagnosis, visual acuity, glaucoma stage, glaucoma type and presence of other ocular disease were found to be significantly associated with quality of life.

However, variables such as ethnicity, duration of treatment, laterality, drug side effect and drug adherence did not have statistically significant association with quality of life.

Table 4: Bivariate and Multivariate analysis of variables with quality of life among glaucoma patients at university of Gondar hospital eye care and teaching center, Gondar Ethiopia, 2015 (n= 307).

Variable	Quality of life		COR (95%CI)	AOR (95%CI)
	Poor	Good		
Age				
<40 years	8(19)	34(81)	1.00	1.00
41-70 years	107(56)	84(44)	5.41(2.38-12.31)***	3.51(1.19-10.28)**
≥ 71 years	47(63.5)	27(36.5)	7.39(2.99-18.26)***	3.72(1.15-12.02)**
Sex				
Male	118(58.7)	83(41.3)	2.00(1.24-3.23)***	
Female	44(41.5)	62(58.5)	1.00	
Residence				
Rural	119(70)	51(30)	5.10 (3.13-8.30) ***	2.16(1.10-4.22) **
Urban	43(31.4)	94(68.6)	1.00	1.00
Marital status				
Married	125(57.9)	91(42.1)	2.00 (1.21-3.29)***	2.27(1.13-4.56)**
Currently unmarried	37(40.7)	54(59.3)	1.00	1.00
Religion				
Orthodox	155(54.8)	128(45.2)	2.94(1.18-7.31)**	
Muslim/protestant	7(29.2)	17(70.8)	1.00	
Education				
Unable to read and write	83(60.1)	55(39.9)	8.62(3.60-20.63)***	
Able to read and write	64(68.8)	29(31.2)	12.61(5.05-31.48)***	
Primary school	8(27.6)	21(72.4)	2.17(0.69-6.83)	
Secondary school and above	7(14.9)	40(85.1)	1.00	
Ethnicity				
Amhara	160(53.7)	138(46.3)	4.06(0.83-19.86)*	
Tigray	2(22.2)	7(77.8)	1.00	
Monthly Income				
< 400	108(72.5)	41(27.5)	22.65(8.39-61.18)***	10.79(3.36-34.64)***
400-1000	49(44.5)	61(55.5)	6.91(2.54-18.77)***	3.07(0,99-9.48)
> 1000	5(10.4)	43(89.6)	1.00	1.00
Occupation				
Government employee	10(17.9)	46(82.1)	1.00	
Farmer	90(69.2)	40(30.8)	10.35(4.75-22.55)***	
House wife	30(46.2)	35(53.8)	3.94(1.70-9.13)**	
Dependent on family	32(57.1)	24(42.9)	6.13(2.58-14.56)***	

Variable	Quality of Life		COR (95%CI)	AOR (95%CI)
	Poor	Good		
Time of diagnosis				
< 1 year	26(34.7)	49(65.3)	1.00	1.00
1-5Years	121(62.4)	73(37.6)	3.12(1.79-5.45) ***	2.57(1.29-5.15)***
≥ 6 years	15(39.5)	23(60.5)	1.23(0.54-2.75)	1.04(0.38-2.84)
Duration of treatment				
< 1 year	79(50.6)	77(49.4)	1.00	
1-5 years	74(56.9)	56(43.1)	1.29(0.80-2.05)	
≥ 6 years	9(42.9)	12(57.1)	0.73(0.29-1.83)	
Presence of other ocular disease				
Yes	88(59.1)	61(40.9)	1.64(1.04-2.57)**	
NO	74(46.8)	84(53.2)	1.00	
Drug side effect				
Yes	77(50.7)	75(49.3)	0.85(0.54-1.32)	
No	85(54.8)	70(45.2)	1.00	
Drug adherence				
Good	42(51.2)	40(48.8)	100	
Poor	120(53.3)	105(46.7)	1.09(0.65-1.80)	
Type of glaucoma				
POAG	75(45.7)	89(54.3)	1.00	
Pseudoexfoliative	73(65.8)	38(34.2)	2.28(1.38-3.75)***	
CACG	14(43.8)	18(56.2)	0.92(0.43-1.98)	
Visual Acuity				
Normal	29(26.1)	82(26.1)	1.00	1.00
Moderate visual impairment	84(66.7)	42(66.7)	5.65(3.22-9.92)***	4.09(2.02-8.34)***
Severe visual impairment	49(70)	21(70)	6.59(3.39-12.81)***	2.88(1.21-6.84)*
Stage of glaucoma				
Mild	49(38.9)	77(61.1)	1.00	1.00
Moderate	40(58.8)	28(41.2)	2.24(1.23-4.09)***	2.22(1.01-4.86)***
Sever	73(64.6)	40(35.4)	2.87(1.69-4.85)***	2.55(1.21-5.34)**
Laterality				
Unilateral	11(39.3)	17(60.7)	1.00	
Bilateral	151(54.1)	128(45.9)	1.82(0.82-4.03)	

P-value represents variables that have statistically significant association on bivariate analysis.
P-value <0.20 *, P– Value <0.05**, P – value <0.01 *** .

4.4.2 Multivariate analysis

The results of multivariate analysis showed that quality of life was significantly associated with age, residence, marital status, monthly income, time of diagnosis, visual acuity and stages of glaucoma.

Respondents whose age 40 and more were 4 times more likely to have poor quality of life as compared to those less than 40 years, 41-71years (AOR=3.51,95%CI:1.19-10.28), >=71(AOR=3.72,95%CI:1.15-12.02).

Being a rural resident was 2 times more likely to have poorer quality of life as compared with urban residents(AOR=2.16, 95%CI: 1.10-4.21).

Regarding on marital status respondents who were married was 2 times more likely to have poor quality of life as compared to currently who are not married (AOR=2.27, 95%CI:1.13- 4.56).

Regarding monthly income, those who had monthly income of<400 ETB were 11 times more likely to have poor quality of life (AOR= 10.79, 95%CI: 3.36-34.64) compared to those who had monthly income of above 1000ETB.

Time of diagnosis was found to be significantly associated with poor quality of life. Respondents who had 1-5 years time of diagnosis were about 3 times more likely to be affected on their QOL(AOR=2.57, 95%CI: 1.29-5.15) compared to those who had less than one year of duration of illness.

Regarding visual acuity moderately visually impaired respondents were 4 times more likely to have poor quality of life (AOR=4.09.40, 95%CI: 2.02- 8.34), while those who had severe VI were 3 times more likely to have poor QOL (AOR=2.88, 95%CI: 1.21-6.83) as compared to those who had normal visual acuity.

Regarding glaucoma staging those respondents who had moderate glaucoma were 2 times more likely to have poor QOL (AOR= 2.22, 95%CI: 1.01-4.86) while those who had severe glaucoma 3 times more likely to have poor QOL (AOR=2.56, 95%CI:1.21-5.34) as compared to those who had mild glaucoma.

Sex, religion, education, occupation, ethnicity, glaucoma type and other ocular disease were not statistically significant with quality of life on multivariate logistic regression analysis.

Table 5: Bivariate and Multivariate analysis of variables with quality of life among glaucoma patients at university of Gondar hospital eye care and teaching center, Gondar Ethiopia, 2015 (n= 307).

Variable	Quality of life		COR (95%CI)	AOR (95%CI)
	Poor	Good		
Age				
<40 years	8(19)	34(81)	1.00	1.00
41-70 years	107(56)	84(44)	5.41(2.38-12.31)***	3.51(1.19-10.28)*
≥ 71 years	47(63.5)	27(36.5)	7.39(2.99-18.26)***	3.72(1.15-12.02)*
Residence				
Rural	119(70)	51(30)	5.10 (3.13-8.30) ***	2.16(1.10-4.22) *
Urban	43(31.4)	94(68.6)	1.00	1.00
Marital status				
Married	125(57.9)	91(42.1)	2.00 (1.21-3.29)**	2.27(1.13-4.56)*
Currently unmarried	37(40.7)	54(59.3)	1.00	1.00
Monthly Income				
< 400	108(72.5)	41(27.5)	22.65(8.39-61.18)***	10.79(3.36-34.64)***
400-1000	49(44.5)	61(55.5)	6.91(2.54-18.77)***	3.07(0,99-9.48)
> 1000	5(10.4)	43(89.6)	1.00	1.00
Time of diagnosis				
< 1 year	26(34.7)	49(65.3)	1.00	1.00
1-5Years	121(62.4)	73(37.6)	3.12(1.79-5.45) ***	2.57(1.29-5.15)**
≥ 6 years	15(39.5)	23(60.5)	1.23(0.54-2.75)	1.04(0.38-2.84)
Visual Acuity				
Normal	29(26.1)	82(26.1)	1.00	1.00
Moderate visual impairment	84(66.7)	42(66.7)	5.65(3.22-9.92)***	4.09(2.02-8.34)***
Severe visual impairment	49(70)	21(70)	6.59(3.39-12.81)***	2.88(1.21-6.84)*
Stage of glaucoma				
Mild	49(38.9)	77(61.1)	1.00	1.00
Moderate	40(58.8)	28(41.2)	2.24(1.23-4.09)**	2.22(1.01-4.86)*
Sever	73(64.6)	40(35.4)	2.87(1.69-4.85)***	2.55(1.21-5.34)*

P-value represents variables that have statistically significant association on multivariate analysis:

p – value <0.05,* p – value <0.01, ** P – value< 0.001***.

5. Discussion

In this study, the GQOL-15 showed that glaucoma patients had poor quality of life in domains: Outdoor mobility 174 (56.7%), Dark adaptation and glare 166 (54.1%) and Peripheral vision 155(50.5%) which is consistent with other study findings(24, 26).In line with other study (2, 8) central and near vision only 138 (45%) of respondents had poor QOL.

This may be due to the fact that glaucoma respects central vision as a result of this central and near vision may not be affected until late stage of the disease course.

Similar to other studies (14, 22, 39-41), increasing age were four times more likely to have poor QOL. This may be explained as age increases the severity of disease, difficulty in caring themselves, lack support and economic dependency.

In this study, patients who live in the rural areas were two times more likely to have poor quality of life as compared with urban patients. This may be due to glaucoma patients who live in rural areas may not be seek medical attention for early detection and diagnosis, seeking care very late after getting advanced in glaucoma stages. Moreover, rural patients may have less income, for example, in this study, 67% of rural patients have less than 400 ETB.

Regarding marital status, respondents who were married was 2 times more likely to have poor quality of life as compared to currently who are not married (AOR=2.27, 95%CI:1.13- 4.56). The reason may be due to the higher proportion (78.8%) of married respondents in this study were from rural areas who may have less socio-economic statuses, in addition to this those married individuals were giving attention to their family.

As expected, respondents with less income (<400 ETB), were 11 times more likely to have poor quality of life among glaucoma patients, this implies that patients with poor economic status have less likely to have good quality of life. The result could be mainly

due to the fact that those with better monthly income can access and afford health services which later contribute to improve quality of life.

Time of diagnosis was found to be significantly associated with poor quality of life. Respondents who had 1-5 years time of diagnosis were about 3 times more likely affected than patient with less than 1 year. The finding of this study were in line with other study(6). This could be mainly due to the fact that drug expense, intensive and lifelong follow up might affect their social interaction and overall quality life.
In contrast to this finding newly diagnosed patients have Poor QOL due to worry about likelihood of blindness (35). In this study those who had ≥ 6 years were not significantly associated. This might be due to 60.5% of them residing in urban.

Consistent with other studies (14, 15, 18, 30, 34), patients with increasing visual impairment was more likely to have poor quality of life in this study. This is may be due to the fact that as the visual acuity decreases their daily activities may be compromised thereby affecting their social and economic status, leading them to poor life. Moreover, as the severity of glaucoma increase, their quality of life was more likely to become poor which is consistent with other similar studies ((16, 34, 42, 43).

6. Limitations of the study

This study has some limitations. Firstly, the study design was cross-sectional and the association between QOL and several variables may not be causal. Secondly, the glaucoma classification in this study was based on CDR while other studies used visual field measurement may lead inconsistent results with study findings and thirdly self report bias regarding glaucoma drug non adherence.

7. Conclusion and recommendations

7.1 Conclusion

This study indicates that high proportion of patients with glaucoma have poor quality of life. Increasing age, rural residence, low monthly income, long time of diagnosis, increasing visual impairment and increasing glaucoma severity were significantly associated with poor quality of life. Establishing glaucoma screening program at community level for early detection and treatment, increasing income, special attention for those severely visually impaired, who have sever glaucoma , rural dwellers and elders are important factors for improving the quality of life of patients with glaucoma.

7.2 Recommendations

- **To ministry of health and other NGOS'**

Establishing glaucoma screening program at community level for early detection and treatment, rehabilitation center for those who have severe visual impairment and severe glaucoma and increasing income might be helpful.

- **To clinicians**

Provide health education and special attention for those severely visually impaired, who have sever glaucoma , rural dwellers and elders are important factors for improving the quality of life of patients with glaucoma.

- **To researchers**

Further study is needed on this study area.

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9. Annexes

9.1 Consent form

Patients Information sheet Code No: ----------

Dear participants.

My name is Banchamelak Zeraye; the University of Gondar undertaking a Masters degree in clinical optometry. Conducting a study on title on quality of life and associated factors among glaucoma patients as partial fulfillment of MSc in clinical optometry. This questionnaire prepared to collect data to assess the quality of life and associated factors among glaucoma patients. The aim of the study is to assess quality of life and associated factors among glaucoma patients. If you agree to be included in the study, I would like to ask you to sign on a document to show your agreement; participate in the interview and answer the questions accordingly your participation is completely voluntary, and you can refuse to participate or stop and withdraw from the study at any time. Refusal to participate will not result in loss of medical care provided or any other benefits. The information in your records is strictly confidential.

Do you agree? I have listened to the description of the study and I understand. I agree to participate in it.

Signature ----------

9.2. Data collection instruments

This questionnaire is designed to assess quality of life and associated factors among glaucoma patients at university of Gondar Hospital, department of ophthalmology, Gondar. Based on the results, possible suggestion will be given to clinicians to provide efficient and sustainable management. All the respondents are kindly requested to respond all the questions honestly. Remember your name is not recorded and no one will be able to find out who respond this questionnaire

The questionnaire has four parts. It will take about 30 minutes to complete the interview. Please try to respond all questions. Thank you very much for your patience.

Part :I

Socio-demographic characteristics

S.no	Questions	Response and coding
101	Age in year	----------
102	Sex	1. Male 2. Female
103	Residence	1. Urban 2. Rural
104	Marital status	1. Married 3. Divorced 2. Single 4. Widowed
105	Religion	1. Orthodox 4. Catholic 2. Muslim 5Others 3. Protestant(specify)_____
106	Educational status	1.unable to read and write 2. Read and write only 3._____grade
107	Occupation	1. Employs 4. House wife 2. Merchant 5. Day labor 3 Farmer. 6.None/dependent on family 7.Others (specify)----------
108	Ethnicity	1. Amhara 3.Oromo 2. Tigre4. Others (specify)----------
109	Monthly income in birr	_____

Part II

Clinical characteristics

201	Time of diagnosis	----------	
202	Current visual acuity	OD _____ OS ----------	
203	Stages of glaucoma based on CD Ratio :	OD 1.Mild 2.Moderate 3.Advanced 4. absolute 5. no	OS 1.Mild 2.Moderate 3.Advanced 4. absolute 5. no
204	Drug side effect	1. None 3. Burning sensation 2. Dryness 4. Redness 5. Others----------	
205	Duration of treatment	1. Less than 1 year 2. 1 – 5 years 3.6 – 10 years 4. Greater than 10 Years	
206	Glaucoma diagnosis	1. Primary open-angle closure 3. Chronic angle 2. Exfoliation 4. Other	
207	Presence of other eye diseases	1. Corneal diseases 3. Vascular diseases 2. Cataract 4.Macular diseases 5. other specify 6.no	

Part III
Glaucoma related Quality of Life (GQL-15) questionnaire

0 = Abstinence from activity owing to non-visual reasons
1 = No difficulty 3 = Some difficulty, 5= Severe difficulty
2 = A little bit of difficulty, 4 = Quite a lot of difficult,

	Glaucoma relates quality of life (GQL-15)	0	1	2	3	4	5
301	Reading newspapers , sewing, hand craft	0	1	2	3	4	5
302	Walking after dark	0	1	2	3	4	5
303	Seeing at night	0	1	2	3	4	5
304	Walking on uneven road	0	1	2	3	4	5
305	Adjusting to bright lights	0	1	2	3	4	5
306	Adjusting to dim lights	0	1	2	3	4	5
307	Going from dark room and vice versa	0	1	2	3	4	5
308	Tripping over objects	0	1	2	3	4	5
309	Seeing objects coming from side	0	1	2	3	4	5
310	Crossing the road	0	1	2	3	4	5
311	Walking on steps/stairs	0	1	2	3	4	5
312	Bumping into objects	0	1	2	3	4	5
313	Judging distance of foot to step/surb	0	1	2	3	4	5
314	Finding dropped objects	0	1	2	3	4	5
315	Recognizing faces.	0	1	2	3	4	5

PART VI Drug non adherence measurement

Morisky 8-Item Medication Adherence Questionnaire			
401.	Do you sometimes forget to take your medicine?	No=0	Yes=1
402.	People sometimes miss taking their medicines for reasons other than forgetting. Thinking over the past 2 weeks, were there any days when you did not take your medicine?	No=0	Yes=1
403.	Have you ever cut back or stopped taking your medicine without telling your doctor because you felt worse when you took it?	No=0	Yes=1
404.	When you travel or leave home, do you sometimes forget to bring along your medicine?	No=0	Yes=1
405.	Did you take all your medicines yesterday?	No=0	Yes=1
406.	When you feel under control, do you sometimes stop taking your medicine?	No=0	Yes=1
407.	Taking medicine every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your treatment plan?	No=0	Yes=1
408.	How often do you have difficulty remembering to take all your medicine? __ A. Never/rarely __ B. Once in a while __ C. Sometimes __ D. Usually __ E. All the time	No=0	Yes=1

Name and signature of data collector ----------Signature----------Date---------
Name and signature of supervisor---------- Signature----------Date----------

Thank you

የታካሚው መረጃ ቅጽ እና ተሳትፎ ማረጋገጫ መለያ ቁጥር ----------

የታካሚው መረጃ

<u>ውድ ተሳታፊዎች</u>

ስሜ ባንችአምላክ ዘርአይ ይባላል፡፡በጎንደር ዩኒቨርሲቲ ሆስፒታል የድህረ ምረቃ ተማሪ ነኝ፡፡ የማጠናዉ ጥናት ከአይን ግፊት በሽታ ጋር የሚኖሩ ሰዎች የሚገጥማቸውን የህይወት የኦኗር ጥራት ደረጃ እና መንስኤዎቹን የክሊኒካል ኦፕቶሜትሪ ህክምና በከፊል ለሁለተኛ ድግሪ ማሟያ ነዉ፡፡

ይህ መጠይቅ የተዘጋጀዉ ከአይን ግፊት በሽታ ጋር የሚኖሩ ሰዎች የሚገጥማቸውን የህይወት አኗኗር የጥራት ደረጃ እና መንስኤዎቹ ላይ መረጃ ለመሰብሰብ ነዉ፡፡የዚህ ጥናት ዓላማ በዉጤቱ መሰረት ከአይን ግፊት በሽታ ችግር ጋር ከአኗኗር ሁኔታ መዛባት ጋር ያለዉን ተዛማጅነት ለማጥናት ነዉ፡፡በዚህ ጥናት ላይ ለመሳተፍ ከፈለጉ የስምምነት ፊርማዎትን በቅፁ ላይ መፈረም ይኖርብዎታል፡፡ ከዚያም በመረጃ ሰብሳቢዎቹ ምላሽዎን እንዲሰጡ ይጠየቃሉ፡፡

የርሰዎ ተሳትፎ በሙሉ በፍቃደኝነት ላይ የተመሰረተ ነዉ ፡፡መሳተፍ ባልፈለጉ ጊዜ ላለመሳተፍ መወሰን የሚችሉ ሲሆን የሚፈልጉትን የጤና አገልግሎት ከማግኘት አይገድበዎትም፡፡ ለእርስዎ ካልመሰለዎት ከዚህ ጥናት ተሳታፊነት በማንኛዉም ጊዜ ራስዎን የማግለል ሙሉ መብት አለዎት፡፡ መጠይቁ በጥናቱ ስለሚካተቱ ግለሰቦች ስምና መለያ አይጻፍበትም፡፡ የሚገኘው መረጃም በሚስጥር የሚያዝ ሲሆን ግኙቱ ምበጥቅል የሚቀርብ ይሆናል፡፡

ለመሳተፍ ፈቃደኛነዎት? አዎ ☐ አይደለሁም ☐

ፊርማ ----------

መጠይቅ

ይህ መጠይቅ የተዘጋጀዉ በጎንደር ዩኒቨርስቲ ሆስፒታል የአይን ህክምና ክፍል ክትትል ላይ ያሉ ከአይን ግፊት በሽታ ጋር የሚኖሩ ሰዎች የሚገጥማቸውን የህይወት አኗኗር የጥራት ደረጃ እናመንስኤዎቹ ላይ መረጃ ለመሰብሰብ ነዉ፡፡በጥናቱ ዉጤት መሰረት ለህክምና ሞያተኞች ትክክለኛ እና ቋሚ ሀሳቦችን ይሰጣል፡፡ሁሉም የመጠይቅ ተሳታፊዎች ጥያቄዎቹን በታማኝነት እንዲመልሱ በትህትና እንጠይቃለን፡፡ አስታዉሱ፡-ስም መፃፍ አያስፈልግም እንድሁም ማንም ሰዉ የተሞላዉን መጠይቅ ማን እንደሞላዉ ማወቅ አይችልም፡፡

መጠይቁ አራት ክፍል አለው፡፡ ቃለ መጠይቁን ለማጠናቀቅ 20 ደቂቃ የሚፈጅ ሲሆን ሁሉንም ጥያቄዎች ለመመለስ ይሞክሩ፡፡ለትእግስትዎ እናሰመግናለን፡፡

ክፍል ፤ ማህበራዊመረጃዎች

ተ.ቀ	መጠይቅ	ምርጫ
101	እድሜ ስንት ነው	----------
102	ፆታ	1.ወንድ2..ሴት
103	የመኖሪያ ቦታ	1. ከተማ2..ገጠር
104	የጋብቻ ሁኔታዎ	1. ያገባ/ች 3.የፈታ/ች 2. ያላገባ/ች 4. የሞተበት/ባት
105	ሀይማኖትዎ ምንድን ነው	1. ኦርቶዶክስ 4. ካቶሊክ 2. መስሊም 5. ሌላ ካለ ይገለፅ ------- 3. ፕሮቴስታንት
106	የትምህርት ደረጃ	1. ማንበብ እና መጻፍየሚችል 2. ማንበብና መጻፍ ብቻ የማይችል 3. _____ ክፍል ይገለጽ
107	ስራዎ ምንድን ነው	1. የመንግስት ሰራተኛ 4. የቤት እመቤት 2. ነጋዴ 5. የቀን ሰራተኛ 3. ግብርና 6. የለም በቤተሰብስር 7. ሌላ ካለ----------
108	ብሔርዎ ምንድን ነው	1. አማራ 3. ኦሮሞ 2. ትግሬ 4. ሌላ ካለ ይገለፅ ----
109	ወርሃዊ ገቢዎ ምን ያህል ብር ነው	----------

ክፍል II ህመምመረጃ

ተ.ቀ	መጠይቅ	ምርጫ
201	የአይን ግፊትበሽታ ካመመዎት (ካወቁት) ምን ያህል ጊዜ ይሆናል	----------
202	አሁን ያለዉ የእይታ ሁኔታ	የቀኝአይን --------- የግራአይን --------
203	የአይን ግፊት በሽታ ደረጃ ፡	<u>የቀኝአይን</u> 1. ማይልድ 2. ሞደሬት 3. አድቫንስድ 4. አብሶሉት 5. የለም <u>የግራአይን</u> 1. ማይልድ 2. ሞደሬት 3. አድቫንስድ 4. አብሶሉት 5. የለም
204	የመድሀኒት የጎንዮሽ ጉዳት	1. ምንም የለም 3. የአይን ማቃጠል ስሚት 2. የአይን ድርቀት ስሜት 4. የአይን መቅላት 5. ሌላ_____
205	ለምን ያህል ጊዜ መድሃኒተዎን ወሰዱ	1. 1 ዓመትብታች2. 1—5 ዓመት 3.6-10 አመት4. ከ10 ዓመት በላይ
206	የአይን ግፊት በሽታ አይነት	1.ፕራይመሪ ኦፕንአንግል ግላኮማ 2. ሲዶኤክስፎሌቲቭ ግላኮማ 3.ክሮኒክአንግልክሎዣር ግላኮማ 4.ሌላ ----------
207	ሌላ የአይን በሽታ አለ	1. የአይን ብሌን ህመም 3. ቫስኩለር ዲዝዝ 2. የአይን ሞራ 4. ማኩላር ዲዝዝ 5.ሌላ ካለ ይገለፅ---------- 6. የለም

ክፍል III ከአይን ግፊት በሽታ ጋር የህይወት አኗኗር የጥራት ደረጃ መለኪያ መጠይቅ

0 = በእይታ ችግር ባልሆነ ምክንያት ስራ መስራት አለመቻል

1 = ምንም ችግር የለም 4 = በጣም ችግር አለ

2 = ትንሽ ችግር አለ

3 = መጠነኛ ችግር አለ 5 =እጅግ በጣም ችግር አለ

ተ.ቀ	ከአይን ግፊት በሽታ ጋር የህይወት አኗኗር የጥራት ደረጃ መለኪያ	0	1	2	3	4	5
301	ጋዜጣ ማንበብ ፣ እህል መልቀም፣የእጅ ስራ፤ እሾህ ማውጣት ፤ የተንቀሳቃሽ ስልክ ቁጥር መለየት፤ የፀሎት መጸጎፍ ማንብበብ /ቁርአን መቅራት	0	1	2	3	4	5
302	በጨለማ የግር ጉዞ ማድረግ	0	1	2	3	4	5
303	በጨለማ ጊዚ እይታ	0	1	2	3	4	5
304	ባልተስተካከለ (ወጣ ገባ በሆነ) መንገድ የግር ጉዞ ማድረግ	0	1	2	3	4	5
305	በደመቀ ብርሃን (በፀሐይ ጮራ) የማየት ችሎታ	0	1	2	3	4	5
306	በደበዘዘ ብርሃን (ድግዝግዝ ሲል) የማየት ቸሎታ	0	1	2	3	4	5
307	ከጨለማ ክፍል ወደ ብርሀን /ከብርሀን ወደ ጨለማ ክፍል በግር ጉዞ ማድረግ	0	1	2	3	4	5
308	መደናቀፍ	0	1	2	3	4	5
309	በጎን የሚመጡ ነገሮችን መለየት	0	1	2	3	4	5
310	መንገድ ማቋረጥ መቻል	0	1	2	3	4	5
311	ደረጃ(ዳገት እና ቁልቁለት) መዉጣት እና መዉረድ መቻል	0	1	2	3	4	5
312	ከእቃ / ከግድግዳ / ከዛፍ / ከበር ጋርመጋጨት	0	1	2	3	4	5
313	እግር ከምድር ጋር ያልዉን ርቀት መገምት መቻል	0	1	2	3	4	5
314	የወደቀ እቃን ለይቶ ማንሳት	0	1	2	3	4	5
315	የሰዉ መልክ መለየት መቻል	0	1	2	3	4	5

ክፍል IV

በሀኪም ትዕዛዝ መሰረት የመድሀኒት አጠቃቀም መለኪያ በህመምተኛው የሚሞላ የሞርስኪ ባለስምንት መጠይቅ

ተ.ቁ	ጥያቄዎች	አላውቅም=0	አዎ=1
401	መድሃኒትዎን መውሰድ ረስተው/ዘንግተው ያውቃሉ?	አላውቅም=0	አዎ=1
403	ከመርሳት ውጭ ሰዎች በሌላ ምክንያት አንዳንዴ መድሐኒታቸውን ሳይወስዱ ይቀራሉ።እርስዎ ባለፉት ሁለት ሳምንታት መድሐኒትዎን ያልወሰዱባቸው ቀናት አሉ?	አላውቅም=0	አዎ=1
404	መድሐኒትዎን ሲወስዱ ሕመሙ የባሰብዎት ስለመሰለዎት ሐኪምዎን ሳያማክሩ መድሐኒት አቋርጠው ያውቃሉ?	አላውቅም=0	አዎ=1
405	መንገድ ሲጓዙ ወይም ከቤት በሚወጡበት ጊዜ አንዳንዴ መድሐኒትዎን ለመያዝ ረስተው/ዘንግተው ያውቃሉ?	አላውቅም=0	አዎ=1
406	ሁሉንም መድሐኒትዎትን ትላንት ወስደዋል?	አላውቅም=0	አዎ=1
407	የህመምዎ ምልክቶች (ህመምዎ) በቁጥጥር ውስጥ የሆነ በመሰለዎት ጊዜ፤አንዳንዴ መድሐኒት መውሰድን አቋርጠው ያውቃሉ?	አላውቅም=0	አዎ=1
408	ቀን በቀን በተከታታይ መድሐኒት መውሰድ ለአንዳንድ ሰዎች ያስቸግራቸዋል።አርስዎ በአግባቡ መድሐኒትዎን በመውሰድዎ (የሕክምና መርሐ-ግብርዎን በመከታተልዎ) ተቸግረው ያውቃሉ?	አላውቅም=0	አዎ=1
409	ምን ያህል ጊዜ አስታውሰው ሁሉንም መድሐኒትዎን ለመውሰድ ተቸግረው ያውቃሉ? 1. በጭራሽ 4. አልፎአልፎ 2. በአጋጣሚ አንዳንዴ 3. አንዳንዴ 5. ሁልጊዜ	አላውቅም=0	አዎ=1

ስለ ግምገማው አስተያየት ካለዎት?_____

የመረጃ ሰብሳቢ ስም እና ፊርማ _____ ቀን _____
የሱፐርቫይዘር ስም እና ፊርማ _____ ቀን _____
በጣም አመሰግናለሁ!!!
ሌላ አስያየት ከለዎት----------

Assurance of the investigator

The undersigned agrees to accept responsibility for the scientific, ethical and technical conduct of the research project and for provision of the required progress reports as pre terms and conditions for the research and publication office of the University of Gondar, College of Medicine and Health Sciences, department of optometry in effect at the time of grant is forwarded as the result of application.

Name of the student: Banchamelak Zeraye signature:_____ date_____

Approval of the Advisor (s)

Advisors' name

1. Dr. Fisseha Admassu (MD Assi Pro) Signature ---------- Date ----------
2. Dr. Yared Assefa (MD, MPH) Signature ---------- Date ----------